

THE OPEN BUSINESS MODEL IN A DYNAMIC BUSINESS ENVIRONMENT: A LITERATURE REVIEW

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ABSTRACT

The open business model is the integration of open innovation with a business model. It is an important bridging construct between innovation and organisational performance in public and private organisation environments. The open business model is characterised by consistent change in the pursuit of competitiveness. Organisations' inability to navigate environmental changes and challenges successfully, or their complacency about doing so, are major issues that have proved costly or life-threatening for many firms. Organisations constantly face two issues: competitiveness, and changes in the business environment. The literature points to numerous contentions about the open business model construct, about which the professional and academic fraternities have not yet reached a conclusion. Interestingly, there is near-homogeneity in the findings that business models are naturally stable and that, therefore, the open business model requires conscious effort and ingenuity to adopt. The open business model is a rising construct of public and private organisation environments, arousing interest and raising a plethora of questions from multiple groups.

OPSOMMING

Die oop sakemodel is die integrasie van oop innovasie en 'n sakemodel. Dit is 'n belangrike oorbrugsvoorstelling tussen innovasie en organisatoriese prestasie in openbare en privaat organisasie-omgewings. Die oop sakemodel word gekenmerk deur konstante verandering in die strewe na mededingendheid. Organisasies se onvermoë om omgewingsveranderinge en -uitdagings suksesvol te hanteer en/of hul met oorgawe uit te voer, is belangrike kwessies wat vir baie maatskappye duur of lewensbedreigend is. Organisasies moet voortdurend oor twee sake besin: mededingendheid en veranderinge in die besigheids-omgewing. Die literatuur dui op talle stellings rondom die oop sakemodel-konstruksie. Die professionele en akademiese groepe het nog nie 'n finale gevolgtrekking bereik nie. Interessant genoeg is daar redelike ooreenkomste tussen die bevindings dat sakemodelle natuurlik stabiel is, en daarom vereis die oop sakemodel bewuste moeite en vindingrykheid om dit aan te neem. Die oop sakemodel wek egter baie belangstelling by openbare en private organisasies, en het 'n oorvloed vrae uit verskeie groepe tot gevolg.

1 INTRODUCTION

South Africa considers innovation to be an important catalyst in the economy, and National Treasury has budgeted R13.6 billion over the medium term [1], with R1 billion set aside in 2018/19 for innovation-oriented activities [2]. This is predominantly distributed through public sector-driven initiatives, some of which are partner-oriented. The extensive participation in in-licensing – for example, in enterprise resource planning (ERP) systems such as the Systems, Applications and Products (SAP) suite, and numerous public-private partnerships such as the Cisco Networking

Academy – is only one of the many tools with which public sector organisations have harnessed and created value from open innovation.

Research still struggles to provide a unified and generally accepted definition of the open business model concept [3]. Different domains, therefore, have used and developed the concept independently in silos [4]. Based on the definition of the business model proposed by A. Osterwalder&Y. Pigneur [5], the open business model in this study is defined as a construct that transcends organisational boundaries and defines the rationale of how that organisation creates, delivers, and captures value. We posit that the open business model still seeks to achieve the same objectives as the business model, although external parties are explicitly involved. These parties are collectively referred to as the business ecosystem.

Research on open business models is still very new, and researchers have primarily focused on the benefits of open business models [6-8], developing typologies [9-11], identifying challenges associated with implementing open business models [12], and the link to performance [13]. However, despite the undoubted relevance of openness and collaboration in today's networked economy, the majority of existing business model research is firm-centric [14, 15] and the aspects and effects of openness are not sufficiently understood [11].

2 METHODOLOGY

In this study, a systematic literature review has been employed because it is replicable and transparent [16]. It is also unbiased and comprehensive [17], trustworthy, rigorous and auditable [18], and provides a coherent overview [19]. The systematic literature review also gives a theoretical grounding for envisaged further exploration, and allows the development of a framework or model.

2.1 Search strategy

Three databases – the ISI Web of Science, EBSCOhost, and Scopus – were chosen for the literature search. The ISI Web of Science's Social Sciences Citation Index (SSCI) database was chosen due to its status as one of the most comprehensive databases of peer-reviewed journals in the social sciences [20]. Furthermore, it is known to employ strict inclusion evaluation processes [21]. The EBSCOhost database was chosen because it is among the largest and most comprehensive databases for business-oriented scholarly full-text journals compared with other popular databases [22]. Scopus was chosen due to its immense popularity alongside the ISI Web of Science, with some studies, such as that of Falagas, Pitsouni, Malietzis and Pappas [e.g. 23] rating it the largest searchable citation and abstract source for literature. Scopus and the ISI Web of Science are two of the most extensive databases [24].

Questions around Google Scholar's transparency, precision, consistency, and completeness as a scientific resource informed the choice to use it as a supplement for retrieval rather than as a primary literature source [25, 26].

Following in the footsteps of S. Schneider&P. Spieth [27], we adopted the three-stage process for systematic literature reviews suggested by D. Tranfield, D. Denyer&P. Smart [28]. We identified our research objective and then designed our literature review process. This was followed by the review process itself, and a report on the review.

2.2 Study selection

The first phase of the electronic database search selected articles that were published between 2002 and April 2017. The search used the key phrases 'open innovation', 'business model', and 'open business model'. The second phase eliminated articles that did not meet the inclusion criteria, such as the key phrase, the category or domain area of the study, and the publication and document type. It was critical that each article be vetted against relevant inclusion criteria in order to maintain the validity and reliability of the review [29]. Further elimination was based on the methodological screening template (see Table 1). These selection criteria were similar to criteria followed by L. Pittaway, M. Robertson, K. Munir, D. Denyer&A. Neely [30].

Table 1: Criteria for methodological screening

Symbol	Definition of criteria
A	Type of literature limited to academic, therefore peer-reviewed, sources.
B	Topic/field of study should be in, or resonate with, management and information communication technology or relate to, or inform, part or all of its affiliated or related fields.
γ	Studies with no (0) citations over at least three years in a research area reasonably well-covered in existing literature.
δ	Results limited to the top five publications and journals relevant to the field of management, technology, innovation, and their related fields; order determined by hit count.
ϵ	Studies relating to management, technology, innovation, and organisational strategy, culture, or change.

One assumption of citation analysis is that authors cite their influences; so citations serve as surrogates for the influence of the cited work [31]. Our elimination of papers with no citation (criterion γ) over three years is based on this understanding, with the interpretation that such papers have yet to influence the research field.

3 THEORETICAL BACKGROUND

We conducted a review of the open business model construct and expanded it to include the basic constructs of a business model and open innovation to achieve completeness and finality. Our understanding of the open business model, as defined above, follows the work of H. Chesbrough [32]. Furthermore, the components of open innovation and the business model ultimately define the components of the open business model. Thus the study and comprehension of these concepts are critical. An alternative view of the open business model's conception is also offered. Figure 1 is a simplified depiction of our understanding of the open business model.

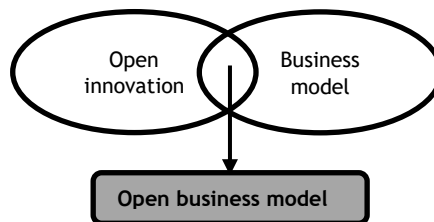


Figure 1: Conception of the open business model

3.1 Open innovation

Open innovation is best understood from the original definition as a paradigm that assumes that organisations can and should use external and internal ideas, as well as internal and external paths to market, as they look to advance their technology [33]. The well-documented cases of open innovation champions in the USA, such as IBM and Procter and Gamble, have helped to catapult growing worldwide interest in this paradigm [34] (see Figure 2).

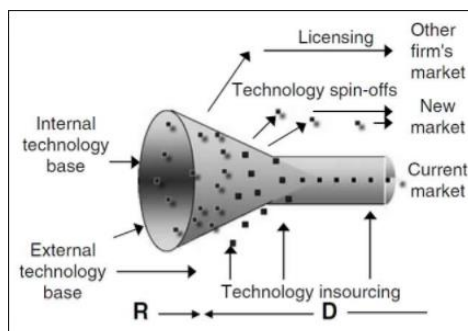


Figure 2: The open innovation model [35]

Questions about the practice and governance of open innovation have been inevitable. One of these concerns the literal or contextual use of the word 'open'. Table 2 depicts open innovation practices as inbound or outbound, which denotes the direction of knowledge flow. Chesbrough [36] defines outside-in (or inbound) as knowledge sourced from outside the organisation for internal application, and inside-out (or outbound) as knowledge produced internally and released for external application.

Table 2: Open innovation practices

Open innovation practice	Author(s)
Inbound	
Alliances	M. Bianchi, A. Cavaliere, D. Chiaroni, F. Frattini&V. Chiesa [37], E. Enkel, O. Gassmann&H. Chesbrough [38]
Purchase of scientific services	M. Bianchi, A. Cavaliere, D. Chiaroni, F. Frattini&V. Chiesa [37], D. Chiaroni, V. Chiesa&F. Frattini [39]
In-licensing	M. Bianchi, A. Cavaliere, D. Chiaroni, F. Frattini&V. Chiesa [37], K.-H. Tsai&J.-C. Wang [40], O. Gassmann [41], A.L.D.A. Burcharth, M.P. Knudsen&H.A. Søndergaard [42]
Institutional collaboration	K. Laursen&A. Salter [43]
Venture capital	D. Benson&R.H. Ziedonis [44]
Acquisition	W. Vanhaverbeke, I. Vermeersch&S. De Zutter [45], T. Holzmann, K. Sailer&B.R. Katzy [46]
Customer involvement	A. Spithoven, B. Clarysse&M. Knockaert [47], V. Van de Vrande, J.P.J. de Jong, W. Vanhaverbeke&M. de Rochemont [48]
External networking (including conferences, fairs, knowledge clusters, crowdsourcing)	O. Gassmann [41], H. Van Der Meer [49], P.E. Harland&A.-M. Nienaber [50]
Outbound	
Spinoff	H. Chesbrough&R.S. Rosenbloom [51], H. Chesbrough&S. Brunswicker [52]
Supply of scientific services	M. Bianchi, A. Cavaliere, D. Chiaroni, F. Frattini&V. Chiesa [37], D. Chiaroni, V. Chiesa&F. Frattini [39]
Out-licensing	M. Bianchi, A. Cavaliere, D. Chiaroni, F. Frattini&V. Chiesa [37], U. Lichtenthaler&H. Ernst [53], U. Lichtenthaler&H. Ernst [54]
External technology commercialisation	U. Lichtenthaler&H. Ernst [53]
Knowledge exploitation	A.L.D.A. Burcharth, M.P. Knudsen&H.A. Søndergaard [42], V. Van de Vrande, J.P.J. de Jong, W. Vanhaverbeke&M. de Rochemont [48], P. Wyncarczyk, P. Piperopoulos&M. McAdam [55]
Venturing out	H. Van Der Meer [49], H. Chesbrough&S. Brunswicker [52]
Industry groups	H. Van Der Meer [49]
Institutional collaboration/partnerships	H. Van Der Meer [49]

Some authors, such as Gassmann, Enkel and Chesbrough [e.g. 56], provide empirical evidence of large, well-known companies such as IBM, BASF, and BMW exhibiting different practices and degrees of openness. P. Trott&D. Hartmann [57] and L. Dahlander&D.M. Gann [58] noted criticism of the open innovation concept for constructing what they consider to be an artificial dichotomy between closed and open approaches. Exploring different degrees and types of openness in a continuum, such as the open business model, seems to provide an interesting direction for open innovation investigations [59].

3.2 Business model

While various authors have studied the business model construct, which provides valuable insights, there is currently no consensus about definitions and conceptual boundaries [60]. There are broad understandings of the business model, such as “framework for making money” [61], a “blueprint for how to run a business” [5], and “the logic of the firm, the way it operates and how it creates value for its customers” [62]. More comprehensive definitions are available in the literature. We prefer the ones of C. Baden-Fuller&M.S. Morgan [63], who describe how a firm organises itself to create and distribute value in a profitable manner, and A. Osterwalder&Y. Pigneur [5], who describe the rationale of how an organisation creates, delivers, and captures value. The business model of A. Osterwalder&Y. Pigneur [5] became the business model canvas (BMC) (see Figure 3). This is used by various large organisations, small and medium enterprises (SMEs), and potential entrepreneurs.

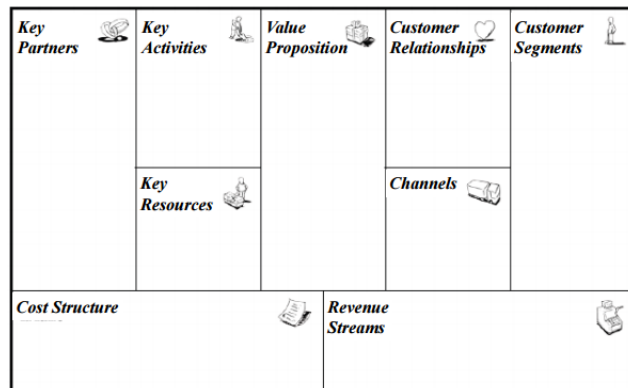


Figure 3: The business model canvas [5]

B.W. Wirtz, A. Pistoia, S. Ullrich&V. Göttel [64] summarise previous definitions for business models by regarding the purpose of a business model’s contents as leading to keeping the promise of service, the satisfaction of needs and profitability, and providing the assurance of a long-term competitive advantage. A deeper understanding of the purpose of the business model can be achieved by focusing on the elements. The BMC, arguably the most popular business model framework, was applied as the benchmark for comparing the business model elements mentioned in various sources (see Table 3).

3.3 Open business model conception – an alternative view

One stream in the literature, represented by Davey, Brennan, Meenan and McAdam [e.g. 7, 73, 74], and others, closely links the open business model to openness about an organisation’s research and development activities in relation to the open innovation paradigm defined by H.W. Chesbrough [33]. This view subscribes to the centrality of open innovation in the open business model construct. The other stream does not necessarily see the open business model as requiring openness and collaboration to reside in (open) innovation activities [e.g. 11, 12, 75]. The scholars in the latter stream reiterate that the “openness to innovations and the openness of business models need to be adequately recognised, understood and treated as separate phenomena” [11].

M. Heikkila&J. Heikkila [76] noted that this difference appeared markedly between American and European scholars. The American school of thought mainly concentrated on classifying and using business models in a context of open innovation [77, 78], while the European school has focused more on the ontologies and design methodologies of business models [5, 79]. Proponents of the former have had a larger share of coverage in the literature than the latter, for whom (including Weiblen [e.g. 80]) the alternative view of an open business model is more attractive.

Table 3: Matching business model elements in the literature against the business model canvas

BMC elements Authors	Business model elements								
	Customer segments	Value propositions	Channels	Customer relationships	Revenue streams	Key resources	Key activities	Key partnerships	Cost structure
C.M. DaSilva, P. Trkman, K. Desouza&J. Lindič [65]		Customer value proposition	Value network		Earning logic	Resources and capabilities			
L. Achtenhagen, L. Melin&L. Naldi [62]						Critical capabilities	Strategising actions, activities		
J. Aspara, J.A. Lamberg, A. Laukia&H. Tikkanen [66]				Business network relationships	Finance and accounting	Operations and resources			Strategy and structure
M.W. Johnson, C.M. Christensen&H. Kagermann [67]		Customer value proposition			Profit formula	Key resources	Key processes		
H. Chesbrough&R.S. Rosenbloom [51]	Market segment	Value proposition	Structure of the value chain		Revenue mechanism(s), profit potential			Firm position within a value network	Cost structure
B. Demil&X. Lecocq [68]		Propositions for value delivery	Organisational structure			Resources and competencies			
F. Günzel&A.B. Holm [69]		Value proposition	Value delivery		Value capture		Value creation		
D.J. Teece [70]	Market segment	Value mechanisms			Revenue streams				
M.N. Cortimiglia, A. Ghezzi&A.G. Frank [71]		Value proposition	Value delivery		Value appropriation		Value creation	Value networking	
M.W. Johnson [72]		Customer value proposition			Profit formula	Key resources	Key processes		

S. Djelassi&l. Decoopman [81] explicitly describe the open business model as a type of business model with a direct association with open innovation. A.B. Holm, F. Gunzel&J.P. Ulhoi [11] took a slightly different approach by looking at the implicit duality of openness: openness to innovations, and openness of business models. Either explicitly or implicitly, the universally accepted view is that the open business model is a way of connecting strategic decisions with value creation to customers (business or managerial strategy), through the mechanism employed to capture it (innovation strategy), and converting it to profit (financial or economic strategy). Some prominent scholars have called for open business model research to be diverted from the current line of argument (as noted between the American and the European schools of thought), and rather be viewed as a continuum of practices [e.g. 9, 58].

4 RESULTS AND DISCUSSION

Using the selection criteria described at the end of the methodology section, articles were imported into the EndNote reference management software, and quality checks – such as duplicate elimination and full-text search – were undertaken. Some 120 articles were then selected for review (see Table 4).

Table 4: Article selection for review, grouped by keyword and database

Keyword	Database	Initial search output	Methodological screening					Articles selected for review
			α	β	γ	δ	ε	
Open innovation	EBSCOhost	171	25	43	n/a	55	33	15
	Scopus	1433	18	241	0	1060	92	22
	Web of Science	304	n/a	68	1	186	24	25
	Total	1908	43	352	1	1301	149	62
Business model	EBSCOhost	428	222	78	n/a	112	10	6
	Scopus	4071	101	993	23	2798	136	20
	Web of Science	398	n/a	140	7	231	5	15
	Total	4897	323	1211	30	3141	151	41
Open business model	EBSCOhost	4	0	0	n/a	1	1	2
	Scopus	21	0	6	3	0	4	8
	Web of Science	30	n/a	14	8	n/a	1	7
	Total	55	0	20	11	1	6	17
Grand total		6860	366	1583	42	4443	306	120

See Table 5 below for the list of journals found to be most popular across the three domains, shown by the number of articles and their proportion of the total. It can be noted from Table 5 that five journals together accounted for over half of the total number of articles.

Table 5: Journals most prolific in the open innovation, business model, and open business model domains

Journal	Number of papers	Percentage of total
<i>Long Range Planning</i>	18	15
<i>Technology Analysis and Strategic Management</i>	17	14.2
<i>Research and Development Management</i>	16	13.3
<i>Research-Technology Management</i>	10	8.3
<i>Technovation</i>	10	8.3
<i>International Journal of Technology Management</i>	8	6.7
<i>International Journal of Innovation Management</i>	8	6.7

Journal	Number of papers	Percentage of total
<i>European Journal of Innovation Management</i>	6	5
<i>Strategic Entrepreneurship Journal</i>	5	4.2
<i>Management Decision</i>	4	3.3
<i>Industrial Marketing Management</i>	3	2.5
<i>International Entrepreneurship and Management Journal</i>	2	1.7
Other journals (one each)	13	10.8

A geographic perspective was also taken, which indicated that of the 120 articles identified, the largest number of authors came from the USA, followed by Germany and Spain. A number of countries were represented by only one author, while none of the articles reviewed had any author from Africa. Figure 4 depicts the number of articles reviewed in relation to the country of domicile of the author(s). The proportion of the number of articles per country relative to the total is also given as a percentage.

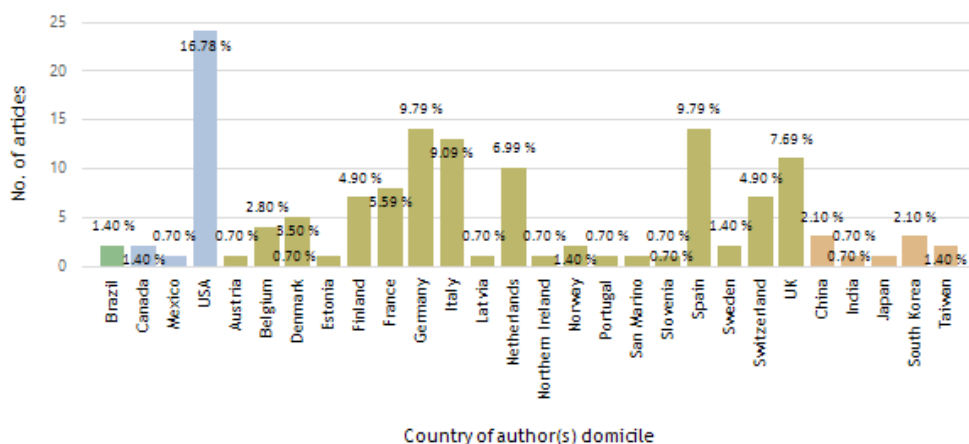


Figure 4: The number and proportion of articles by country of author domicile

As can be deduced from Figures 4 and 5, European countries had the largest representation in the articles reviewed. Asia was represented by five countries, each with between one and three articles. No African country is represented in the review; but it is interesting to note that three of South Africa's partners in the association of five major emerging national economies: Brazil, Russia, India, China and South Africa (BRICS) are represented. The three are Brazil, China and India.

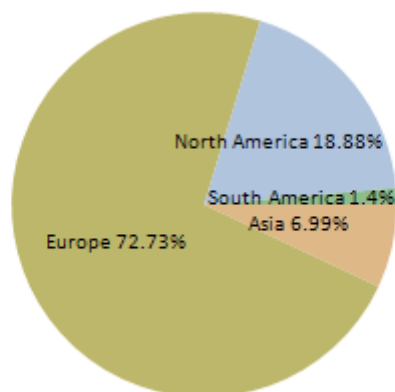


Figure 5: Proportion of articles by continent of the domicile of the author(s)

The review was further structured into the open business model's main functions and objectives, as well as elements of an archetype framework, as discussed in the next section. A crucial premise that

underpins the discussion that follows is the inherent need for the adaptation and renewal that underlies the business model, which is often represented in a systemic form as a collection of elements and their underlying relations. Like any living system, these elements and their relations give business models their own life cycle [60]. S.G. Winter&G. Szulanski [82] argue that “the formula or business model, far from being a quantum of information that is revealed in a flash, is typically a complex set of interdependent routines that is discovered, adjusted and fine-tuned by ‘doing’”.

4.1 The open business model as a bridging construct between innovation and organisational performance

One of the biggest challenges currently facing the open innovation community is proving the actual benefit of openness, especially due to a lack of value measurement instruments [56]. Some companies pursue openness simply because it is a popular phenomenon at present, not because of forecast revenue streams. The (open) business model has the difficult responsibility of defining the mechanism for these revenue streams.

The literature noted multiple conflicts, with one prominent conflict in the link between dynamism and organisational success. The majority of the relevant studies found that successful organisations are dynamic in undertaking inbound and outbound, as well as short- and long-term, targets [83]. However, others such as Wei, Zhao and Zhang [85] argue against this notion. Some older studies also indicated their failure to link dynamism and firm performance [e.g. 84]. A similar contradiction is noted in studies that look at only one of the two dimensions, with the majority of studies finding that there is a positive relationship between inbound open innovation activities and innovation outcomes [e.g. 85, 86]; other studies [e.g. 43, 87] show that the effects of this relationship can also be negative.

D.J. Teece [70]’s study [70], however, revealed that the business model and enterprise performance relationship are not entirely conclusive; rather, they are context-specific. D.J. Teece [70] found that a great business model does not necessarily lead to better enterprise performance. V. Van de Vrande, J.P.J. de Jong, W. Vanhaverbeke&M. de Rochemont [48] and U. Lichtenthaler [88] found that SMEs predominantly embark on openness to keep up with their competition or to avoid being pushed out of business. On the other hand, large corporations embark on openness to achieve an iron grip on markets. The literature has yet to show how the benefits map out in collaboration engagements.

The previous generation of strategy scholars argue that survival (a basic achievement that organisations seek before expecting to attain performance) depends on exercising strategic leadership; building dynamic core competencies through both in-house development and strategic partnerships; focusing on and developing human capital; effectively using technologies; and implementing new organisational structures and culture [89]. Further exploration of these could establish precise mapping between innovation and performance.

4.2 Adaptation mechanisms related to environmental change

Openness is generally reflected as a feasible bridge for organisational performance and as an adaptation mechanism for organisations that face environmental change. These general benefits include numerous formal and informal, direct and indirect, planned and derived, and primary and secondary benefits. Despite these benefits and the general dichotomy in the literature, it is conceded that openness can be excessive and that there is a risk of alliance partners appropriating innovation output to other parties not intended by the focal organisation [90]. Therefore, organisations seem to use formal contracts to organise their open innovation activities with specific partner organisations, rather than engaging in open disclosure [91]. Whatever the need for it, the literature again shows that contracting may not be sufficient for the effective governance of open innovation projects, but that good social relations (non-contractual) may be invaluable [92].

B. Elveaeter, A.J. Berre, H. de Man&M.S. Li [93] noted a movement towards a broader concept of value creation beyond economic value, which includes defining new measurements for success beyond economic performance. This movement predicts that enterprises of the future will be better off embracing the different perspectives of sustainability, as the environment continuously changes. Customer demands and regulations that target specific environmental and social practices that are undertaken by organisations will increasingly have economic consequences [93], as would advances in information and communication technologies [94], globalisation, reduced product lifecycles,

increased customer demands for new and reliable products and services, and reduced barriers of entry for new competitors [95].

4.3 Elements of an archetype framework of the open business model

Multiple studies tend to recommend openness [e.g. 42, 74, 96]. However, there is no explicit directive about what managers have to deal with or how they should overcome the challenges brought about by openness. A strategic and operating management model, or rather a toolkit, is necessary. In more progressive organisations, business model change is not necessarily motivated by poor organisational performance, but can even occur while the organisation is thriving [97]. Such proactiveness could anticipate a decline in performance, or offer foresight into better returns with a new configuration. The development of new organisational routines, such as evaluation procedures and metrics of performance [74], could be considered to be the foundation of business model archetypes.

Furthermore, the literature generally agrees that enterprises, when operating under uncertainty, should experiment with a range of business models [98]. Through experimentation, the initial value proposition evolves into a viable business model by using a series of trial-and-error changes that are pursued along various dimensions [99].

An open business model archetype does not need to digress from existing knowledge. Only a new configuration of existing elements is necessary. Table 6 indicates the attributes that should be considered in an archetype framework of open business models.

Table 6: Attributes of proposed framework and references

Feature of proposed framework	Authors
Iteration (consists of decision gates and feedback loops)	K. Frankenberger, T. Weiblen, M. Csik&O. Gassmann [13], J. Hagberg&H. Kjellberg [100]
Value calculation mechanism	D.J. Teece [70], K. Storbacka [101]
Strategic agility/flexibility	Y.L. Doz&M. Kosonen [97], H. Chesbrough [102]
Managerial assumptions (effort on proximity to fact)	H. Chesbrough&R.S. Rosenbloom [103], K. Mason&M. Spring [104]
(Organisational) dynamic capability	D.J. Teece [70], K. Mason&S. Leek [105]
Boundary-spanning concept	C. Zott, R. Amit&M. Massa [4], A.B. Holm, F. Gunzel&J.P. Ulhoi [11]

5 CONCLUSIONS

The three main findings of this review are the following:

1. Open business model studies are almost exclusively American and European. Studies on or in Africa could not be detected using the selection criteria of this study.
2. Scholars have not reached a conclusion about comprehending the conception of the open business model. Literature that is more recent challenges and antagonises older, more established literature.
3. There is no archetype of the open business model. The requisite elements are known – the central one being value – but the need for competitiveness and the ever-changing business environment have made the open business model immensely relevant in this era.

Most of the existing research in the field focuses on the potential benefits of openness rather than addressing the disadvantages. This could lead to a biased literature, as noted by L. Dahlander&D.M. Gann [58].

Based on numerous scholars’ predictions of continuing environmental change, the entire economic paradigm for business may change in the long run, leading to a fundamental transformation of the understanding of, and approach to, business models. The usefulness of a business model can be measured when it has been implemented and the consequences of this implementation have been revealed (eventual success or failure). Assessment methods that allow the qualification of new theoretical business models before their implementation, in order to choose, configure, or define appropriate business models prior to application, are necessary. In fact, the lack of ex-ante assessment methods often turns business model selection into a purely intuitive choice that is not based on rational criteria.

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